H partitioning between olivine and melt between 0.1MPa and 12 GPa

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We present the results of an experimentally based partitioning study for H between olivine and silicate melt between 0.1 MPa and 2.5 GPa. We show that the olivine-melt partition coefficient for H vary as a function of pressure, temperature, and melt composition. Importantly, the H partition coefficient was found to be a function of the melt total H_2O contents, such that H_2O is more compatible in olivine at low total melt H_2O contents. We use literature data and produce an empirical model that considers pressure and total water content to predict the H partition coefficient between olivine and melt from 0.1 MPa to 12 GPa. Our new data has implications for melt generation at the mid-ocean ridge, and may imply that low water melting may dry the mantle less than previously thought. In addition, in low total H_2O content planetary setting, H is likely more compatible in olivine than previously thought.